



Technical Information Center
Intel Corporation
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8295

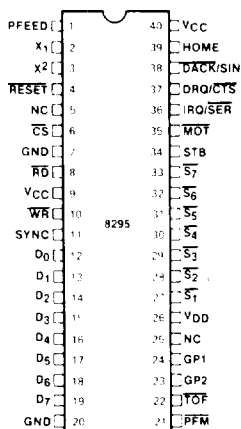
DOT MATRIX PRINTER CONTROLLER

- Interfaces Dot Matrix Printers to MCS-48™, MCS-80™, MCS-85™ Systems
- 40 Character Buffer On Chip
- Serial or Parallel Communication with Host
- DMA Transfer Capability
- Programmable Character Density (10 or 12 Characters/Inch)
- Programmable Print Intensity
- Single or Double Width Printing
- Programmable Multiple Line Feeds
- 3 Tabulations
- 2 General Purpose Outputs

The Intel® 8295 Dot Matrix Printer Controller provides an interface for microprocessors to the LRC 7040 Series dot matrix impact printers. It may also be used as an interface to other similar printers.

The chip may be used in a serial or parallel communication mode with the host processor. Furthermore, it provides internal buffering of up to 40 characters and contains a 7 × 7 matrix character generator accommodating 64 ASCII characters.

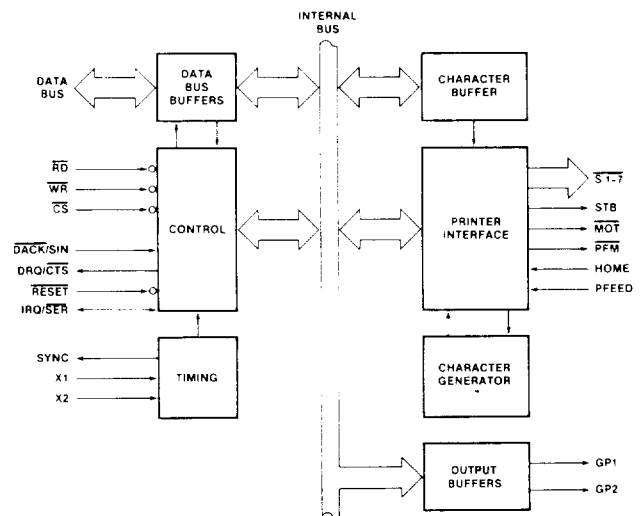
PIN CONFIGURATION



PIN NAMES

PIN NAME	FUNCTION
D0-D7	DATA BUS
RD, WR	READ, WRITE STROBES
CS	CHIP SELECT
RESET	RESET INPUT
X1, X2	FREQUENCY REFERENCE INPUTS
SYNC	HIGH FREQUENCY OUTPUT
MOT, PFM	MAIN PAPER FEED MOTOR DRIVES
DRO, DACK	DMA REQUEST, ACKNOWLEDGE
SIN, CTS	SERIAL INPUT, CLEAR-TO-SEND
IRO/SER	INTERRUPT REQUEST, SERIAL GROUND
ST1-S7	SOLENOID DRIVE OUTPUTS
PFEED	PAPER FEED INPUT
HOME, TOF	HOME TOP-OF-FORM INPUTS
STB	SOLENOID STROBE OUTPUT
GP1, GP2	GENERAL PURPOSE OUTPUTS
VCC, VDD, GND	+5V POWER, GND

BLOCK DIAGRAM



PIN DESCRIPTION

Name	I/O	Pin #	Description	Name	I/O	Pin #	Description
D ₀ -D ₇	I/O	12-19	Three-state bidirectional data bus buffer lines used to interface the 8295 to the host processor in the parallel mode. In the serial mode D ₀ -D ₂ sets up the baud rate.	$\overline{\text{MOT}}$	O	35	Main motor drive, active low.
$\overline{\text{WR}}$	I	10	Write input which enables the master CPU to write data and commands to the 8295. In the serial mode this pin must be tied to V _{SS} .	GP1, GP2	O	23,24	General purpose output pins.
$\overline{\text{RD}}$	I	8	Read input which enables the master CPU to read data and status. In the serial mode this pin must be tied to V _{CC} .	$\overline{\text{S}}_1\text{-}\overline{\text{S}}_7$	O	27-33	Solenoid drive outputs; active low.
$\overline{\text{CS}}$	I	6	Chip select input used to enable the $\overline{\text{RD}}$ and $\overline{\text{WR}}$ inputs except during DMA.	STB	O	34	Solenoid strobe output. used to determine duration of solenoids activation.
$\overline{\text{RESET}}$	I	4	Reset input, active low. After reset the 8295 will be set for 12 characters/inch single width printing, solenoid strobe at 320 msec.	$\overline{\text{TOF}}$	I	22	Top of form input, used to sense top of form signal for type T printer.
PFEED	I	1	Paper feed input switch.	IRQ/ $\overline{\text{SER}}$	I/O	36	In parallel mode it is an interrupt request input to the master CPU; in serial mode it should be strapped to V _{SS} .
HOME	I	39	Home input switch, used by the 8295 to detect that the print head is in the home position.	DRQ/ $\overline{\text{CTS}}$	O	37	In the parallel mode used as DMA request output pin to indicate to the 8257 that a DMA transfer is requested; in the serial mode used as clear-to-send signal.
X ₁ , X ₂	I	2,3	Inputs for a crystal to set internal oscillator frequency. For proper operation use 6 MHz crystal.	$\overline{\text{DACK/SIN}}$	I/O	38	In the parallel mode used as DMA acknowledgement; in the serial mode, used as input for data.
$\overline{\text{PFM}}$	O	21	Paper feed motor drive, active low.	SYNC	O	11	Output signal which occurs once per instruction cycle (2.5 μ sec with 6 MHz crystal); can be used as a reference clock.
				V _{CC}	—	9,40	+5V power supply.
				V _{DD}	—	26	+5V low power standby supply.
				GND	—	20	Circuit and supply ground.

FUNCTIONAL DESCRIPTION

The 8295 interfaces microcomputers to the LRC 7040 Series dot matrix impact printers, and to other similar printers. It provides internal buffering of up to 40 characters. Printing begins automatically when the buffer is full or when a carriage return character is received.

Communication between the 8295 and the host processor can be implemented in either a serial or parallel

mode. The parallel mode allows for character transfers into the buffer via DMA cycles. The serial mode features selectable data rates from 110 to 4800 baud.

The 8295 also offers two general purpose output pins which can be set or cleared by the host processor. They can be used with various printers to implement such functions as ribbon color selection, enabling form release solenoid, and reverse document feed.

COMMAND SUMMARY

Hex Code	Description	Hex Code	Description
00	Clear GP1. This command brings the GP1 pin to a logic low state. After power on it is automatically set high.	09	Tab character.
01	Clear GP2. Same as the above but for GP2.	0A	Line feed.
02	Set GP1. Sets GP1 pin to a logic high state, inverse of command 00.	0B	Multiple Line Feed; must be followed by a byte specifying the number of line feeds.
03	Set GP2. Same as above but for GP2. Inverse command 01.	0C	Top of Form. Enables the line feed output until the Top of Form input is activated.
04	Software Reset. This is a pacify command. This command is not effective immediately after commands requiring a parameter, as the Reset command will be interpreted as a parameter.	0D	Carriage Return. Signifies end of a line and enables the printer to start printing.
05	Print 10 characters/in. density.	0E	Set Tab #1, followed by tab position byte.
06	Print 12 characters/in. density.	0F	Set Tab #2, followed by tab position byte. Should be greater than Tab #1.
07	Print double width characters. This command prints characters at twice the normal width, that is, at either 17 or 20 characters per line.	10	Set Tab #3, followed by tab position byte. Should be greater than Tab #2.
08	Enable DMA mode; must be followed by two bytes specifying the number of data characters to be fetched. Least significant byte accepted first.	11	Print Head Home on Right. On some printers the print head home position is on the right. This command would enable normal left to right printing with such printers.
		12	Set Strobe Width; must be followed by strobe width selection byte. This command adjusts the duration of the strobe activation.

CHARACTER SET

Hex Code	Print Char.	Hex Code	Print Char.	Hex Code	Print Char.	Hex Code	Print Char.
20	space	30	0	40	@	50	P
21	!	31	1	41	A	51	Q
22	"	32	2	42	B	52	R
23	#	33	3	43	C	53	S
24	\$	34	4	44	D	54	T
25	%	35	5	45	E	55	U
26	&	36	6	46	F	56	V
27	,	37	7	47	G	57	W
28	(	38	8	48	H	58	X
29	)	39	9	49	I	59	Y
2A	*	3A	:	5A	J	5A	Z
2B	+	3B	;	4B	K	5B	[
2C	,	3C	<	4C	L	5C	\
2D	-	3D	=	4D	M	5D]
2E	.	3E	>	4E	N	5E	↑
2F	/	4F	?	4F	O	5F	—